T-29-1 – "Alligator Snapping Turtle Movements and Reproduction at Black Bayou Lake National Wildlife Refuge"

Abstract: The Alligator Snapping Turtle (*Macrochelys temminckii*) is the largest freshwater turtle in North America. It is a very secretive species and not much is known about its life history, but past hunting pressures have severely diminished populations throughout its range. The goal of our study was to contribute important biological knowledge of *Macrochelys temminckii* in a lentic ecosystem–with the potential benefit of producing generally applicable guidelines related to management of the species. The objectives were to examine: (1) spatial use of the lake by the sexes over the course of the year; (2) use of the terrestrial environment around the lake for nesting by females, including nest site selection; (3) nest survival, along with hatchling growth, dispersal, survival, and habitat selection; and (4) genetic studies of parentage. Our study site was Black Bayou Lake National Wildlife Refuge in Ouachita Parish.

A total of 114 trap-nights resulted in 32 captured *Macrochelys temminckii*. Catch per unit effort was 0.28 turtles/trap-night. The main goal of turtle trapping was to attach radiotransmitters to study spatial ecology of adults; however, massive transmitter failure led to collection of insufficient data to draw any conclusions. Adult turtles occurred in the lake with a male to female ratio not significantly different from a 1:1 ratio. Male specimens differed significantly from females in overall size.

A total of 65 ovipositional sites were found during the 2003 through 2007 seasons, which corresponded with 28 intact, 7 partially destroyed and 30 fully depredated nests. Average clutch size for all years was 28.8 eggs with a mean egg mass of 28.7 g. Ovipositional sites were found on both the west and east sides of the lake, but females exhibited selection for transect West1 over all other surveyed shoreline habitat to oviposit their eggs from 2004 through 2006. This transect corresponds with an entirely anthropogenic habitat along a railroad causeway. Habitat characteristics that distinguish the area suggest females prefer to nest in areas with a relatively open canopy and steep slope in close proximity to the water.

Nineteen hatchlings were radiotracked during 2006–10 in the spring and 9 in the fall. Hatchlings that were incubated in the laboratory or naturally on the railroad causeway were heavier and had longer carapace lengths than those naturally incubated in a natural soil type; however, there was no significant difference in survivorship due to hatchling size, or between the fall and spring releases. Hatchlings moved more frequently during the months of April and June than any other months. Home range sizes were larger during the fall than either spring or summer. Significant habitat preferences included: shallow water depth, presence of woody debris, presence of woody emergent species (primarily buttonbush, bald cypress and water tupelo), and presence of floating vegetation mats. The 49 day survival rate was estimated between 61 and 82%.

The purpose of the genetic portion of the study was to design and use microsatellite loci to test for evidence of multiple paternity. Microsatellites are simple sequence repeats that mutate at high rates and are especially useful for looking at familial relationships. Three of seven microsatellite loci tested were variable, with from three to five alleles per locus. Those three loci provided evidence of multiple paternity in 13 out of 14 clutches. More loci and/or more variable loci will be required to make actual paternity and maternity assignments in the population. Multiple paternity is an important reproductive strategy in threatened or endangered species because it may help increase effective population size and genetic variability in small populations.

(**Abstract by J. Carr in**: "*Alligator Snapping Turtle (Macrochelys temminckii) Movements and Reproduction at Black Bayou Lake National Wildlife Refuge*"; Final Report (November 2007); Carr, J.L., A. Bass, L. B. White, and L. Besenhofer; University of Louisiana at Monroe; Monroe, LA; 76 pp.)

This grant was closed 30 June 2007. **For more information** about State Wildlife Grant T-29, or to obtain copies of interim or final reports, please contact the State Wildlife Grant Coordinator, LDWF Fur & Refuge Division.